

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE

in cooperation with

STATE AGRICULTURAL EXPERIMENT STATIONS

Results from the

UNIFORM BARLEY WINTER HARDINESS NURSERY

2003-2004

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This is a joint progress report of an investigation underway in the State Agricultural Experiment Stations and the Agricultural Research Service of the U. S. Department of Agriculture. It contains preliminary data which have not been sufficiently confirmed to justify general release; interpretations may be modified with additional experimentation. Confirmed results will be published through established channels. The report is primarily a tool for cooperators, their staff and those with special interest in agricultural research program development.

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COOPERATING AGRICULTURAL EXPERIMENT STATIONS AND PERSONNEL

Country	State	AES Location	Personnel
USA	ID	Aberdeen	D.Obert
USA	KS	Hays	T.J.Martin
USA	NC	Waynesville	J.P.Murphy
USA	NE	Lincoln	S.P.Baenziger
USA	NE	Mead	S.P.Baenziger
USA	SC	Clemson	B.Edge
USA	SD	Watertown	A.Ibrahim
USA	TN	Knoxville	D.West
USA	VA	Blacksburg	C.A.Griffey, T.Pridgen, W.S.Brooks
Russia	Krasnodar	North Caucasus	V.Shevtsov
Turkey		Eskisehir	E.Ozdemir

DIGEST

NUMBER OF TESTS:	11 tests (8 US States, 2 foreign countries)	
NUMBER OF ENTRIES:	17	
EXPERIMENTAL DESIGN:	Single-row, 5-foot plot Two replications Randomized complete block	
DATA RECORDED:	Percent winter survival	
DATA NOT USED IN ANALYSIS:	Aberdeen, ID	100% Survival.
	Waynesville, NC	100% Survival
	Lincoln, NE	100% Survival
	Mead, NE	100% Survival
	Krasnodar, Russia	100% Survival
	Watertown, SD	0% Survival

COMMENTS:

US STATE/COUNTRY	LOCATION	COMMENTS
ID	Aberdeen	Very mild winter, quite a lot of snow, survival rate for everything was 100%.
KS	Manhattan	Survival notes taken on Mar 11, 2004.
NC	Waynesville	All plants survived. There were no appreciable differences in freeze damage, with a uniform level of damage between 10 and 15%.
NE	Lincoln and Mead	No winter killing in either place.
SC	Clemson	Saw little to no brownback, so reduced survival may be due to poor establishment.
SD	Watertown	All lines had 0% survival except for Kenosha which had 80% average survival.
Russia	North Caucasus	Winter was very mild. All entries survived 100% in field w/o leaf damage, including Trebi

Top Ten Ranked Survival Entries

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Rank	Ent No.	Entry	Pedigree	% Survival (across locations)
1	5	Dicktoo (ck)	CI 5529	100
2	4	Kenosha (wht ck)	CI 14025	97.2
3	6	Kentucky 1 (ck)	CI 6050	97
4	7	NE98934	VA83-42-57/Perkins	97
5	1	Tenn. Winter(ck)	CI 6034	95.7
6	13	VA01H-122	90-41-10/90-42-9CMB84A-1664/3/92-42-46/4/SC871077/5/SC871077/92-42-46:HULLESS	94.5
7	12	VA00H-65	SC89585/93-44-316:HULLESS	93.7
8	10	NE98919	NE86841/Sussex9024//NE83826	93
9	8	NE018199	NE94723/NE93727	92
10	9	NE99845	Krasnodark304/2//NE90701	92
LSD (0.05)				47.5

Table 1. Entries in the 2003-2004 Uniform Barley Winter Hardiness Nursery.

Entry No	Entry name	Pedigree	Yrs in Nursery	Contributors
1	Tenn. Winter(ck)	CI 6034	68	
2	Trebi (ck)	CI 936	64	
3	Kearney (ck)	CI 7580	56	
4	Kenosha (wht ck)	CI 14025	29	
5	Dicktoo (ck)	CI 5529	56	Baenziger
6	Kentucky 1 (ck)	CI 6050	68	
7	NE98934	VA83-42-57/Perkins	1	
8	NE018199	NE94723/NE93727	1	
9	NE99845	KrasnodarK304/2//NE90701	1	Baenziger
10	NE98919	NE86841/Sussex9024//NE83826	2	Baenziger
11	Doyce	CMB79-54//90-42-56/90-42-22/3/PAMUNKEY/4/SC890585:HULLESS	2	Griffey
12	VA00H-65	SC89585/93-44-316:HULLESS	2	Griffey
13	VA01H-122	90-41-10/90-42-9CMB84A-1664/3/92-42-46/4/SC871077/5/SC871077/92-42-46:HULLESS	2	Griffey
14	VA01H-5	CMB79-54//90-42-56/90-42-22/3/PAMUNKEY/4/SC890585:HULLESS	2	Griffey
15	VA01H-125	90-41-10/90-42-9//CMB84A-1664/3/92-42-46/4/SC871077/5/SC871077/4/90-41-10/90-42-9//CMB84A-1664/3/Nomini	1	Griffey
16	VA01H-124	90-41-10/90-42-9//CMB84A-1664/3/92-42-46/4/SC871077/5/SC871077/4/90-41-10/90-42-9//CMB84A-1664/3/Nomini	1	Griffey
17	VA01H-68	SC860974/94-42-13	1	Griffey

Table 2. Winter Barley Survival (%) at Various Stations (sorted by entry number)

Ent. No.	Entry Name	Ranked Means	Means across loc	Hays KS	Clemson SC	Knoxville TN	Eskisehir Turkey	Blacksburg VA
1	Tenn. Winter(ck)	5	95.7	82.5	100	100	100	96
2	Trebi (ck)	17	69	7.5	100	95	100	42.5
3	Kearney (ck)	14	90	100	75	100	90	85
4	Kenosha (wht ck)	2	97.2	100	95	100	100	91
5	Dicktoo (ck)	1	100	100	100	100	100	100
6	Kentucky 1 (ck)	3	97	100	100	100	100	85
7	NE98934	4	97	100	100	100	100	85
8	NE018199	9	92	100	95	100	100	65
9	NE99845	10	92	100	100	100	100	60
10	NE98919	8	93	97.5	100	100	100	67.5
11	Doyce	15	89.7	85	100	100	100	63.5
12	VA00H-65	7	93.7	95	100	100	100	73.5
13	VA01H-122	6	94.5	100	100	100	100	72.5
14	VA01H-5	13	91	95	100	97.5	100	62.5
15	VA01H-125	12	91.5	97.5	100	100	100	60
16	VA01H-124	11	92	97.5	100	100	100	62.5
17	VA01H-68	16	85	100	100	100	100	25
Average			91.8	91.6	97.9	99.6	99.4	70.4
LSD (0.05)			47.5	15.4	*ns	*ns	*ns	*ns
CV(%)			15.5	7.8	9.3	2.0	3.5	41.8

*ns = Not significant

Table 3. Winter Barley Survival (%) at Various Stations (sorted by rank)

Ent. No.	Entry Name	Ranked Means	Means across loc	Hays KS	Clemson SC	Knoxville TN	Eskisehir Turkey	Blacksburg VA
5	Dicktoo (ck)	1	100	100	100	100	100	100
4	Kenosha (wht ck)	2	97.2	100	95	100	100	91
6	Kentucky 1 (ck)	3	97	100	100	100	100	85
7	NE98934	4	97	100	100	100	100	85
1	Tenn. Winter(ck)	5	95.7	82.5	100	100	100	96
13	VA01H-122	6	94.5	100	100	100	100	72.5
12	VA00H-65	7	93.7	95	100	100	100	73.5
10	NE98919	8	93	97.5	100	100	100	67.5
8	NE018199	9	92	100	95	100	100	65
9	NE99845	10	92	100	100	100	100	60
16	VA01H-124	11	92	97.5	100	100	100	62.5
15	VA01H-125	12	91.5	97.5	100	100	100	60
14	VA01H-5	13	91	95	100	97.5	100	62.5
3	Kearney (ck)	14	90	100	75	100	90	85
11	Doyce	15	89.7	85	100	100	100	63.5
17	VA01H-68	16	85	100	100	100	100	25
2	Trebi (ck)	17	69	7.5	100	95	100	42.5
Average			91.8	91.6	97.9	99.6	99.4	70.4
LSD (0.05)			47.5	15.4	*ns	*ns	*ns	*ns
CV(%)			15.5	7.8	9.3	2.0	3.5	41.8

*ns = Not significant

Table 4. % Survival of plants tested at -13°C for 24 hrs at Krasnodar, Russia[@]

Entry No	Entry Name	Survival (%)
1	Tenn. Winter(ck)	24
2	Trebi (ck)	0
3	Kearney (ck)	58
4	Kenosha (wht ck)	100
5	Dicktoo (ck)	52
6	Kentucky 1 (ck)	56
7	NE98934	71
8	NE018199	60
9	NE99845	61
10	NE98919	54
11	Doyce	5
12	VA00H-65	23
13	VA01H-122	39
14	VA01H-5	43
15	VA01H-125	41
16	VA01H-124	57
17	VA01H-68	66
	Dobrinya (local check)	47
	Samson (Fakir)	69

@ Plants at 3-4 leaf stage, in wooden box, were exposed to -1 to -3 °C in freezing chamber for 2 d. The temperature of chamber was then lowered to -13°C at the rate of 1°C/h and the plants were held at this temperature for 24 h. After 24 h at 3°C, temperature of chamber was raised to 3°C at 1°C/h and the plants were held at this temperature for 24 h. The plants were then kept in a chamber at 15.25 °C for 10 d and % survival was scored. Values given are the average of two reps.

